

# Affordable Practical High-Efficiency Photovoltaic Concentrator Blanket Assembly for Ultra-Lightweight Solar Arrays, Phase II

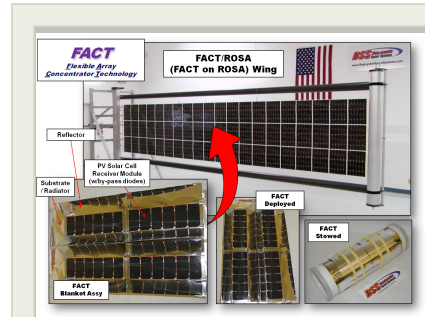
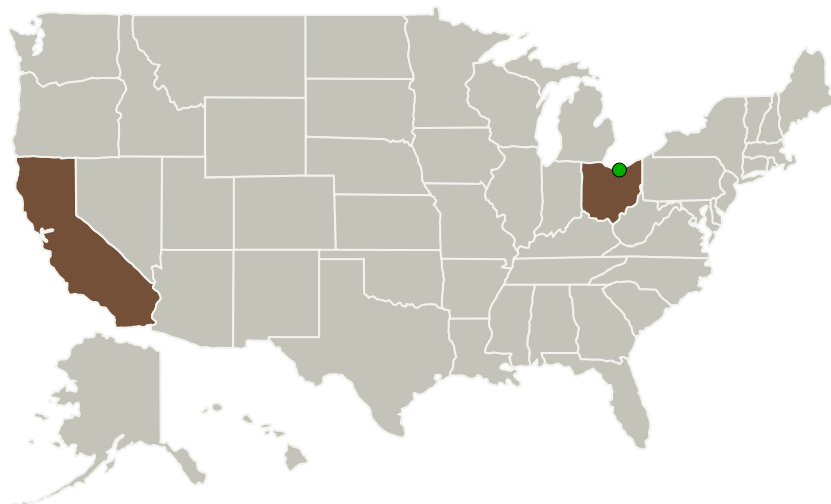
Completed Technology Project (2012 - 2015)



## Project Introduction

Deployable Space Systems, Inc. (DSS) will focus the proposed NASA Phase 2 effort on the development and TRL 5/6 maturation of our innovative Functional Advanced Concentrator Technology (FACT) for standard multi-junction and advanced IMM photovoltaics. FACT is a highly-affordable, practical, high-efficiency, ultra-lightweight photovoltaic concentrator blanket assembly that can be rolled or z-folded in a stowed configuration. FACT coupled to an ultra-lightweight solar array structural platform will provide game-changing performance metrics and unparalleled affordability. FACT will enable emerging SEP Space Science and Exploration missions through its ultra-affordability, ultra-lightweight, ultra-compact stowage volume, and practical/user-friendly off-pointing versus power characteristics. The FACT technology promises to provide NASA/industry a near-term and low-risk flexible blanket technology for advanced solar array systems. The FACT technology provides revolutionary performance in terms of: High specific power ( $>260\text{W/kg}$  BOL with ZTJ/XTJ and  $\sim 400\text{W/kg}$  BOL with IMM PV when coupled to ROSA-array); Affordability ( $>40\%$  cost savings when coupled to ROSA-array); Flexible blanket compatibility / architecture flexibility (accommodates rolled or z-folded blankets); User-friendly off-pointing versus power characteristics; Compact stowage volume ( $>50\text{kW/m}^3$ ); High deployment reliability; High radiation tolerance and high voltage operation capability; Applicability/scalability to many missions (500W-1MW+ sizes); LILT/HIHT operation capability; and Adaptable to standard rigid honeycomb panel arrays.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Deployable Space Systems, Inc(DSS)	Lead Organization	Industry	Goleta, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

## Project Transitions

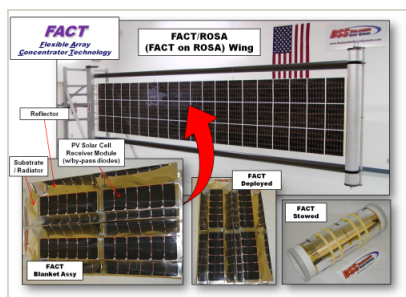
▶ **April 2012:** Project Start

✓ **January 2015:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137377>)

## Images



### Project Image

Affordable Practical High-Efficiency Photovoltaic Concentrator Blanket Assembly for Ultra-Lightweight Solar Arrays  
(<https://techport.nasa.gov/image/127423>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Deployable Space Systems, Inc (DSS)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Brian R Spence

### Co-Investigator:

Brian Spence

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## Technology Maturity (TRL)

Start: **3**  
Current: **6**  
Estimated End: **6**



## Technology Areas

### Primary:

- TX03 Aerospace Power and Energy Storage
  - └ TX03.1 Power Generation and Energy Conversion
    - └ TX03.1.1 Photovoltaic

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System